REMARKS

Applicant is submitting herewith a proposed change to the drawings wherein Figure 1 has been labeled prior art. Assuming that this correction meets with the Examiner's approval, a new formal drawing will be submitted.

Applicant has also cancelled claims 6 and 7, amended claims 1, 3 and 8 and added new claim 10 to overcome the Examiner's objections. For example, in line eight of claim 1, which has now also been included as part of claim 8, Applicant has corrected grammatical problems. Further, as rewritten, the claims call for first grooves and second grooves as suggested by the Examiner and claim 3 provides that said leak proof elements are O-rings.

According, it is respectfully submitted that the claims are now in proper form and that the rejection under 35 U.S.C. §112 should be withdrawn.

In the above mentioned Office Action, the Examiner rejected claim 1 under 35 U.S.C. §102(b) as being anticipated by Black U.S. Patent Number 5,704,250. In making that rejection, the Examiner stated:

> "...Black shows in Figure 3 the use of a ball screw with cooling means comprising: a screw bolt 16 having a spirally threaded groove formed around the outer surface thereof, a hollow screw nut 54 to be sleeved over the screw bolt also having another spirally threaded groove corresponding to the former groove being formed around the inner surface thereof, a plurality of rolling balls 62, 64 interposed between the two grooved that cause the screw bolt and the screw nut to be able to rotate with each other, and an outer cover 30 cover the screw nut such that a cavity 86 being formed therebetween for a cooling agent to flow through thereby reducing the temperature of the screw nut by way of its connection to the reduced temperature of the motor 50."

It is respectfully submitted that Black does not disclose an outer cover covering the screw nut such that a cavity is formed between the screw nut and the cover for a cooling agent to flow through to thereby reduce the temperature of the screw nut as claimed by Applicant in amended claim 1. What Black discloses is cooling passages 86 provided in casing 36 in an encircling relationship to stators 58 and 60 for cooling the stators 58 and 60 of motor 50 and 52. What Applicant does is to form a cavity between the outer cover and the screw nut for a cooling agent to flow through to thereby reduce the temperature of the screw nut. There is no suggestion in the cited reference to provide a cavity in the area of the screw nut for cooling the screw nut.

Claim 1 was also rejected under 35 U.S.C. §103(a) as being unpatentable over 4,741,221 of Hudimac, Jr. and 5,344,230 reference. It is respectfully submitted that the '221 patent discloses an air chamber 31 and does not relate to a cooling fluid as claimed by Applicant and does not disclose a nut or spirally threaded groove. Accordingly it is Applicant's contention that it does not disclose applicant's novel combination of elements or provide any motivation for a person of ordinary skill in the art to combine references in the manner suggested.

It is also respectfully submitted that the U.S. Patent Number 5,344,230 Kowalczyk et al. does not disclose "an outer cover covering said screw nut such that a cavity being formed therebetween for reducing the temperature of the screw nut as claimed by Applicant. Further, the jacketing 15 and barrel portion 14 are one integral part which is different from Applicant's invention.

Claim 1 was further rejected under 35 U.S.C. §103(a) as being unpatentable over Rasmussen U.S. Patent Number 3,029,792. It is respectfully submitted that the '792 patent provides fixed pressure which is not at all like the cooling preparation flowing through Applicant's cavity portion for cooling. Once again, it is Applicant's contention that there is no basis for combining the references in the manner suggested by the Examiner. Accordingly, amended claim 1 should be allowed.

Claim 9 which is dependent on claim 1 is further distinguished over the cited art by calling for, "wherein an entrance pipe with an opening and an exit pipe with an opening are formed in said screw nut for circulation of the cooling agent." It is respectfully submitted that the entrance pipe 43 in Figure 12 of the Miyaguchi et al.,

('838) reference does not disclose or suggest this concept. What the '838 reference discloses is an oil supply hole and does not disclose or suggest an entrance pipe with an opening and an exit pipe with an opening formed in said screw nut for circulation of the cooling agent. Accordingly, it is Applicant's contention that claim 9 should be allowed.

Amended claim 8 has been rewritten in independent form to overcome the rejection under 35 U.S.C. §112, second paragraph. As rewritten it includes all of the limitations of the base claim and any intervening claims. Accordingly, it is respectfully submitted that claim 8 is allowable.

New claim 10 is dependent on claim 8. Accordingly, it is Applicant's contention that new claim 10 is patentably distinguished over the cited art for the same reasons as claim 8 and should be allowed.

For further clarification, it is respectfully submitted that amended claims 1, 3 and 8 and new claim 10 are distinguished over each of the cited references for the following reasons:

1. US 5,704,250:

a) The casing 30 of U.S. Patent Number 5,704,250 is composed on the outer side of stators 58, 60 and ball bearing 70, 72 (paragraph 6, lines 14-18), not composed on the outer diameter of nut 54;

b) The cooling passage 86 of U.S. Patent Number 5,704,250 installed on the casing 30; there is no cavity (such as Applicant's invention) between nut 54 and casing 30 (see Figs. 2 and 3);

paragraph 6, lines 30-31: "cooling passages 86 provided in casing 30 in an encircling relationship to stators 58 and 60" discloses "cooling passages 86" for cooling "stators 58 and 60" of "motor 50 and 52", without mentioning the subject of cooling nut 54 and 56.

However, the cavity portion of Applicant's invention is the space between the outer cover and screw nut, "an outer cover covering said screw nut such that a cavity being formed therebetween for a cooling agent to flow through thereby reducing the temperature of said screw nut (there formed a cavity portion between outer cover and screw nut)";

c) Thus, U.S. Patent Number 5,704,250 does not disclose "an outer cover covering said screw nut such that a cavity being formed therebetween", and does not disclose the purpose of "reducing the temperature of said screw nut".

d) Besides, since the cooling square measure of cooling passages 86 of U.S. Patent Number 5,704,250 is smaller than the cooling square measure of cavity portion in Applicant's invention, thus the cooling effect is not obvious.

U.S. Patent Number 5,704,250 is totally different than Applicant's invention according to the above reasons.

2. U.S. 5,344,230:

The Examiner indicated (paragraph 3, lines 7-9) the above cited document has pointed to the idea of cooling, however, U.S. Patent Number 5,344,230 does not disclose: "an outer cover covering said screw nut such that a cavity being formed therebetween" in Applicant's invention, and without mentioning the purpose of "reducing the temperature of said screw nut".

Besides, "jacketing 15" and "barrel portions 14" are one unity, it is totally different then Applicant's invention.

3. U.S. 4,741,221:

a) As to Claim 1, the function of the "air chamber 31" of Fig. 2 in U.S. Patent Number 4,741,221 is to produce fixed pressure for containing air, to control the pressure of "air chamber 31", to decide whether "piston 42" limits "ball 43" in "valley 46" or not.

It is totally different than a cooling fluid that flows through a cavity to reduce the temperature of the screw nut".

Besides, there is a hole 40 and 41 on screw nut 13 and interlinked with "air chamber 31", however the capacity portions in the inner side and outer side of the screw nut are not interlinked with each other. Thus U.S. Patent Number 4,741,221 is totally different than Applicant's invention.

b) U.S. Patent Number 4,741,221 and U.S. Patent Number 5,344,230 do not disclose or suggest Applicant's invention since U.S. Patent Number 4,741,221 does not

disclose a "nut", and there is no "spirally threaded groove" on "spool 22" such as Applicant's invention.

"Spool 22" is different than a "nut", the effect is not the same as "an outer cover covering said screw nut such that a cavity being formed therebetween for a cooling agent to flow through thereby reducing the temperature of said screw "nut".

According to the above reasons, Applicant's invention is patentably distinguished over U.S. Patent Number 4,741,221 and U.S. Patent Number 5,344,230.

c) As to Claim 2 and 3, "air chamber 31" is to produce fixed pressure to contain the air, thus "O-rings 32" of U.S. Patent number 4,741,221 is to prevent leaking due to the lack of pressure.

However, Claims 2 and 3 are dependent on Claim 1, "several leak proof elements 32" is to prevent the cooling preparation leaking out, thus they are different.

d) As to Claim 7, "bore 33" of U.S. Patent Number 4,741,221 is a hole not a continuous pipe such as "guiding tube 50" of Applicant's invention.

And, U.S. Patent Number 4,741,221 does not mention the function of cooling.

Accordingly, for the above reasons, the U.S. Patent Number 4,741,221 is different than Applicant's invention.

4. U.S. 3,029,792:

a) As to Claim 1, it is the same as U.S. Patent Number 4,741,221, "pressure port 13" of U.S. Patent Number 3,029,792 for providing fixed pressure, not like the cooling preparation flowing through the cavity portion for cooling; and

U.S. Patent Number 3,029,792 does not disclose a rolling ball screw nut, "piston 23 and 25" in U.S. Patent Number 3,029,792 is a piston function, not a rolling ball;

(Figs. 1 and 2) There is no "spirally threaded groove" (such as Applicant's invention) on barrel 30;

"the barrel 30 has a plurality of cylindrical radial openings 20, 22, 24" (Paragraph 1, lines 66-67), thus even combining U.S. Patent Number 3,029,792 and

U.S. Patent Number 5,344,230, according to U.S. Patent Number 3,029,792 does not disclose a "nut", and does not disclose "spirally threaded groove" on barrel 30;

besides, "barrel 30" and "nut" are different, the effect also is different with "an outer cover covering said screw nut such that a cavity being formed therebetween for a cooling agent to flow through thereby reducing the temperature of said screw nut".

b) As to Claims 4 and 6, "passages 11, 12" in U.S. Patent Number 3,029,792 are tunnels on "housing 10" to make "pressure port 13, 14" in "housing 10" interlink directly with the outer "housing 10";

however "enlarged portion of said cavity 314" of Applicant's invention is the cut portion of outer surface of screw nut 31 inside outer cover 32; and the cavity portion in our invention does not interlink directly with the outer side of outer cover 32.

c) As to Claim 7, such as U.S. Patent Number 4,741,221, "opening 22" in U.S. Patent Number 3,029,792 is a hole not a continuous pipe such as "guiding tube 50" in Applicant's invention; U.S. Patent Number 3,029,792 also disclose the function about cooling.

5. U.S. 5,809,838:

As to U.S. Patent Number 5,809,838 an oil storage lubricating rolling ball is, not like the cavity portion in Applicant's invention to make the cooling preparation flow through to cool the screw ball.

Thus, "oil supplying hole 40" in Fig. 12 of U.S. Patent Number 5,809,838 is to pour oil, not to provide the cooling preparation circulation to take away the heat energy.

As to U.S. Patent Number 5,809,838 an oil guide is between screw nut 2 and screw bolt to lubricate rolling ball 3, not like 38 and 312 in Applicant's invention.

6. U.S. 3,169,407:

From screw nut 2 in Fig. 2, the above cited document does not disclose an "outer cover 32".

Since all the claims are now in proper form, and clearly and patentably distinguished over the cited art, prompt favorable action is requested.

Respectfully submitted,

Date: July 21, 2003

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